

REMARKS

Amendments to the drawings have been made on one replacement sheets. In Fig. 4c the reference numeral 210 has been removed at two positions. The reference numerals 200 and 240 have been added to Fig. 4c at these two positions. Reference numeral 200 denotes the obstruction element and reference numeral 240 denotes the first substrate layer.

Claim 9 has been amended to the wording according to the Examiners suggestion "microvale is actuated".

The line space for all the claims has been changed to one and one-half.

With regard to the objections under 35 U.S.C §112, first paragraph, for claims 10 and 11 it is submitted that appropriate amendments have been made to claim 10 to overcome the objection. Claim 10 now specifies how the obstruction element is displaced. Claim 10 now specifies that the obstruction element is displaced with respect to the first substrate layer and the second layer, respectively, to obstruct the flow in a frictionless "free-hanging" manner in order to avoid tribological effects during operation. Claim 10 does not relate to how the actuator is displaced.

With regard to the objections under §102 and §103 claim 1 has been amended so that claim 1 now specifies that the obstruction element is displaceable in a moving direction substantially perpendicular to the direction of main flow and out of plane with respect to the first substrate layer such that a force on the obstruction element caused by the flow when the obstruction element is obstructing the flow is substantially in said direction of main flow.

According to the present invention there is one single direction of main flow along a flow axis, i.e. the in-plane direction defined by the flow duct between the first and second layer.

As stated in the previous reply, the Kluge patent US 6 131 879 does not show a microvalve comprising a first substrate layer defining a first plane and a second layer disposed over the first substrate layer cooperating with the first substrate layer to form a flow duct through which the flow traverses, thereby defining a direction of main flow in the flow duct, parallel to the first plane.

The Kluge patent discloses a flow duct which has no single main direction of flow. Instead, the flow comes in out-of plane through nozzle 30, turns in-plane and turns back out-of-plane through nozzle 32.

This difference has the effect that the cross sectional area of the flow duct along the main flow is perpendicular to the plane of the first substrate layer, which allows the footprint area of the microvalve to be reduced since it is independent from the cross sectional area of the flow duct.

Further, the Kluge patent does not show an obstruction element for obstructing the flow that is displaceable such that a force on the obstruction element caused by the flow when the obstruction element is obstructing the flow is substantially in the direction of main flow.

In the KLUGE valve there is no single direction of main flow, but if the direction of main flow were defined so that the direction of main flow was parallel with the plane 34, then the obstruction element 14 would be displaceable such that a force on the obstruction element caused by the flow would be substantially perpendicular to the direction of main flow. The force on the obstruction element would then be in the same direction as the moving direction, and not in the direction of the flow as is the case with the present invention.

Thereby the Kluge valve suffers from problems with providing a flow obstruction that can sufficiently counteract the pneumatic forces of the flow it controls." This problem is solved with the geometry of the valve according to the present invention as defined in the independent claims.

We agree with the Examiners objection regarding claims 13 and 14. Claims 13 and 14 have therefore been cancelled.

It is submitted that the claims as amended more clearly and distinctly define the invention in relation to the cited art.

In the event there are any questions concerning this Amendment, or the application in general, the Examiner is respectfully urged to telephone the undersigned so that prosecution of the application may be expedited.

No additional fees are believed to be due at this time. However, if necessary to effect a timely response the Commissioner is authorised to deduct the necessary fees from Deposit account No. 501249.

Respectfully submitted,

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Date: 15 December 2009